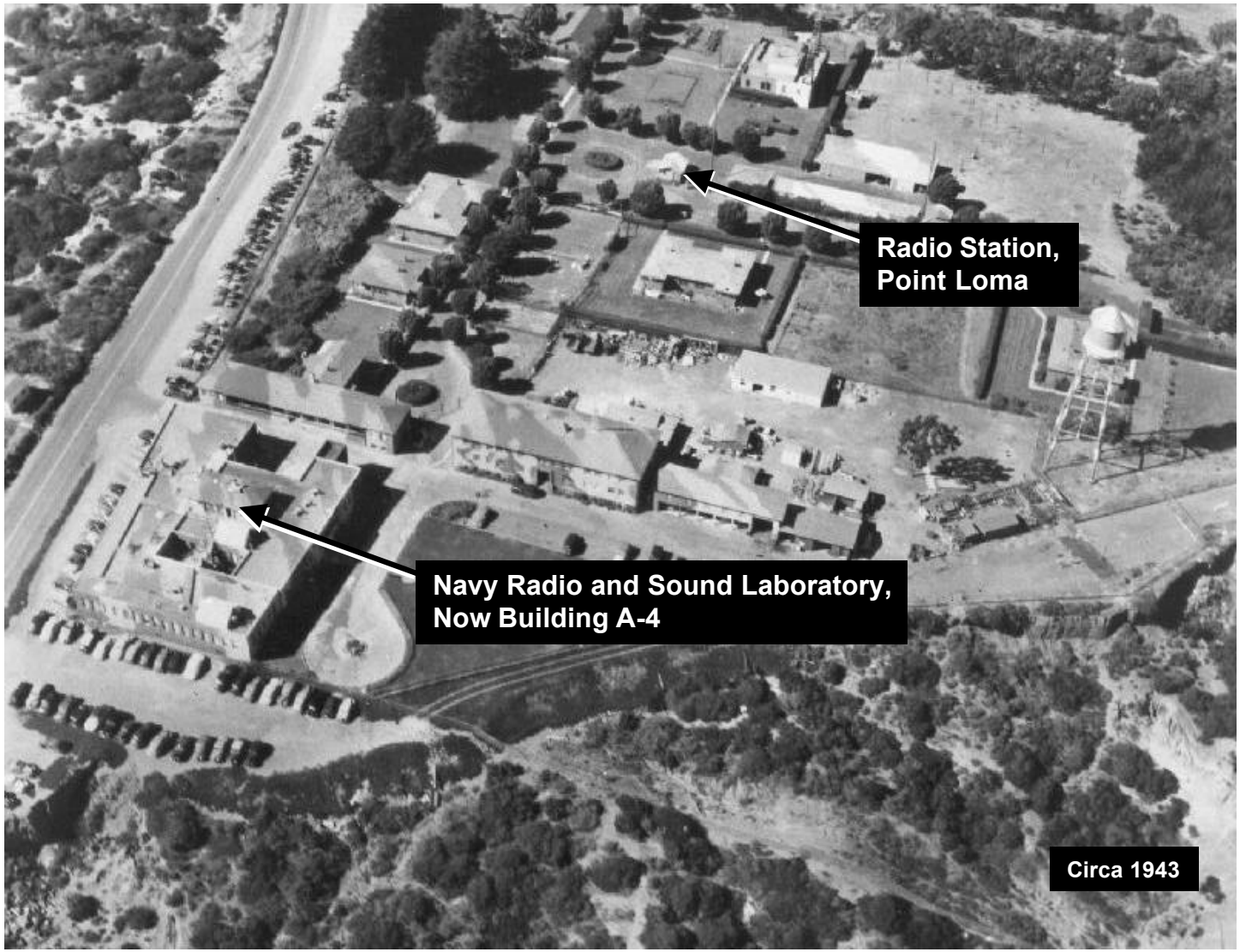
# Command Overview

## CAPT Ernest L. Valdes, USN

**Commanding Officer**
**SPAWAR Systems Center, San Diego**

**Presented to**
**Connecting Technology Conference**
**31 October 2001**

# Navy Radio and Sound Laboratory



SSC SAN DIEGO

# Historic Accomplishments

SPAWAR Systems Center San Diego

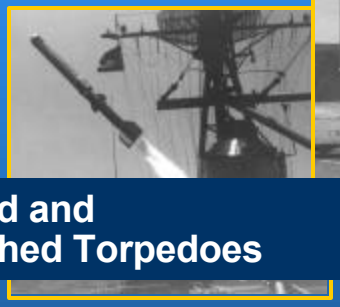
Satellite Comms

Radar / ECM

Oceanography

Towed Arrays

Underwater Acoustics



Air-dropped and Ship-launched Torpedoes

Navy Tactical Data System

Ocean Engineering

Undersea Vehicles

Arctic Submarine Operations

SSC SAN DIEGO

SPAWAR Systems Center San Diego

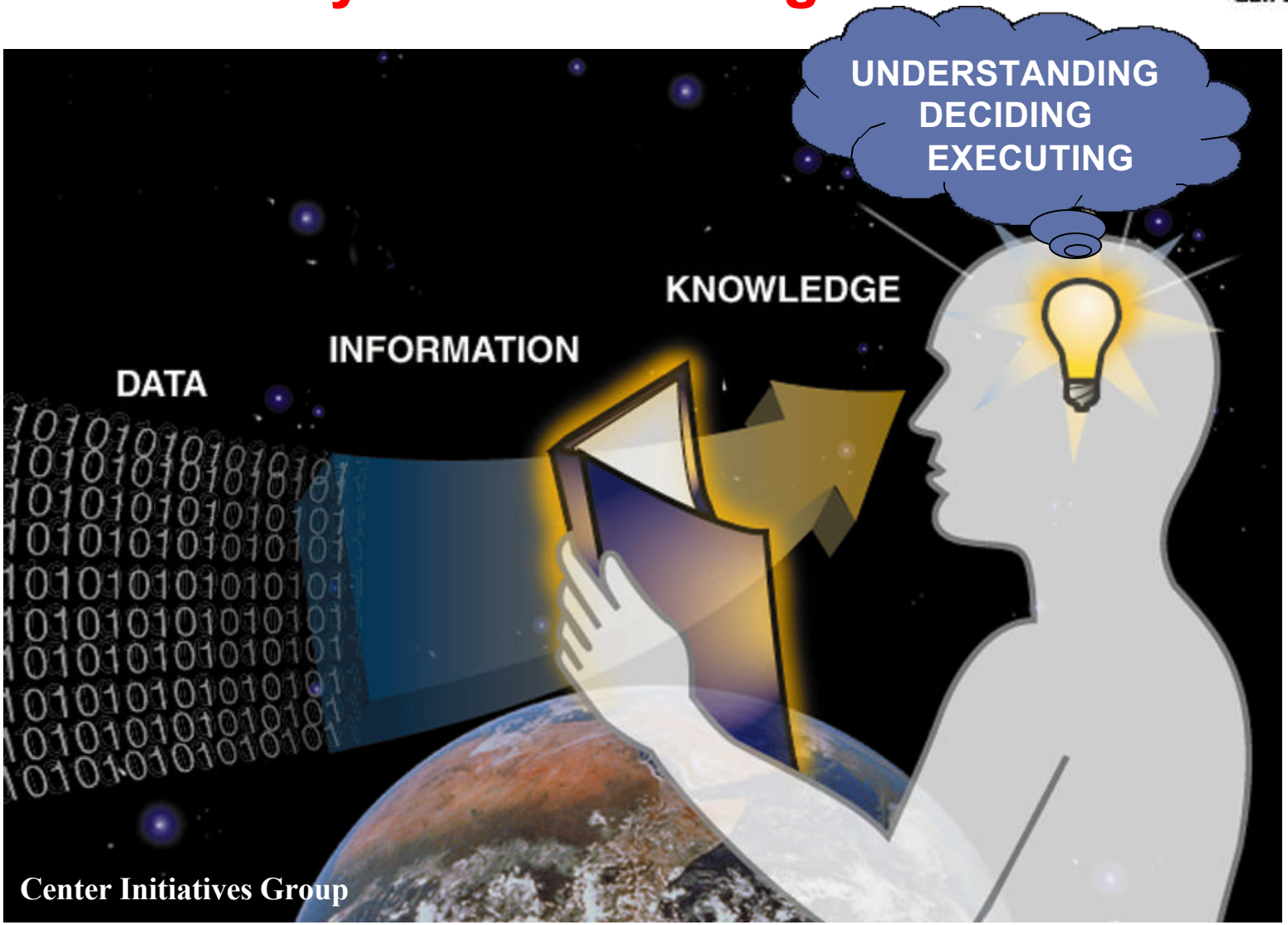
# The Importance of Information

**"Information that is most desired, that is most needed, is current information, which is awfully difficult to get… Time is all-important…(It) is the only commodity which you can never regain. An attack right now may mean much more than an attack a minute from now."**

**– Admiral Arleigh Burke,**

**from his now famous WWII "After Battle Reports"**

# A Primary C4ISR Objective: Timely Understanding



SSC SAN DIEGO

SPAWAR Systems Center San Diego

# Mission

**The Navy's RDT&E, engineering and fleet support center for command and control, communications, ocean surveillance, and the integration of those systems which overarch multiplatforms**

SSC SAN DIEGO

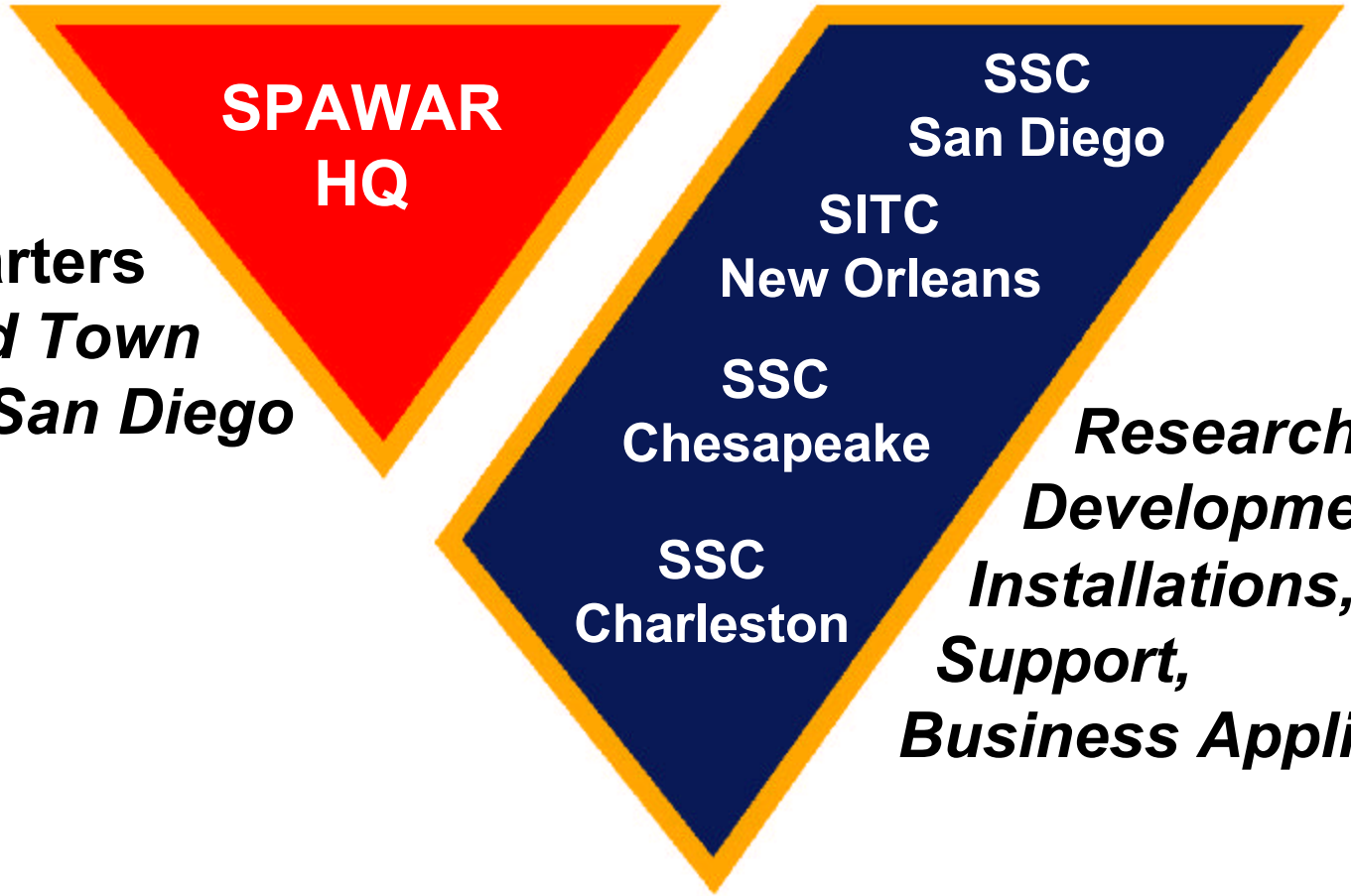
SPAWAR Systems Center San Diego

# Vision

**"To be the Nation's pre-eminent provider of integrated C$^4$ISR solutions for warrior information dominance"**

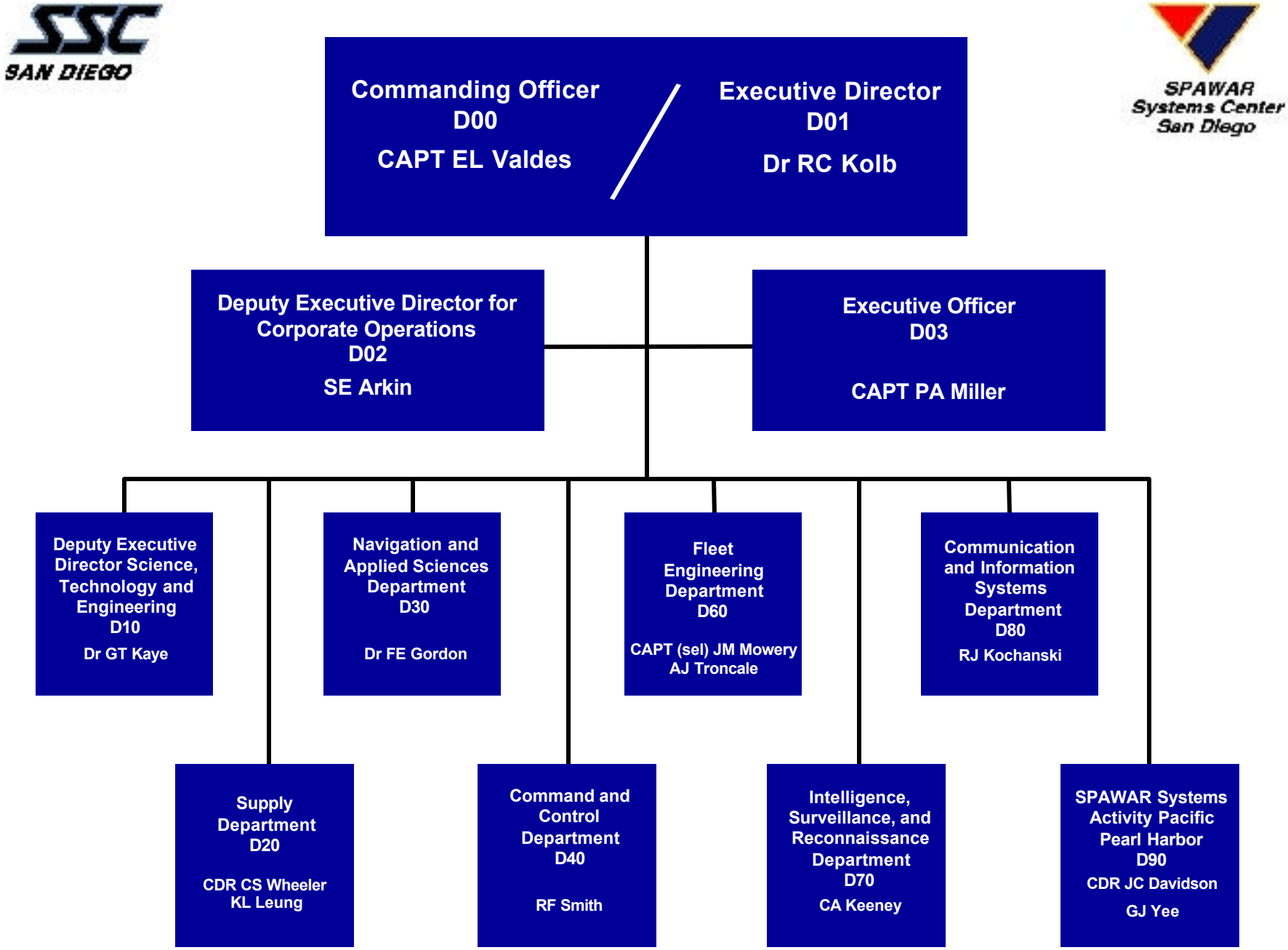
- **PEOPLE - - Highly Technical Workforce (76%)**
  - **2,082 Scientists and Engineers**
  - **585 Technicians/Tech Specialists**
  - **80 Military (Officers and Enlisted)**
  - **1,619 Bachelor's Degrees**
  - **685 Master's Degrees**
  - **213 Doctorate Degrees**
  - **130 Patents issued over the last 5 years**

# *SPAWAR* Corporation




**Headquarters**
***Old Town***
***San Diego***

***Research,***
***Development,***
***Installations,***
***Support,***
***Business Applications***


SSC SAN DIEGO
SPAWAR Systems Center San Diego
Commanding Officer D00 CAPT EL Valdes
Executive Director D01 Dr RC Kolb
Deputy Executive Director for Corporate Operations D02 SE Arkin
Executive Officer D03 CAPT PA Miller
Deputy Executive Director Science, Technology and Engineering D10 Dr GT Kaye
Navigation and Applied Sciences Department D30 Dr FE Gordon
Fleet Engineering Department D60 CAPT (sel) JM Mowery AJ Troncale
Communication and Information Systems Department D80 RJ Kochanski
Supply Department D20 CDR CS Wheeler KL Leung
Command and Control Department D40 RF Smith
Intelligence, Surveillance, and Reconnaissance Department D70 CA Keeney
SPAWAR Systems Activity Pacific Pearl Harbor D90 CDR JC Davidson GJ Yee

SSC SAN DIEGO

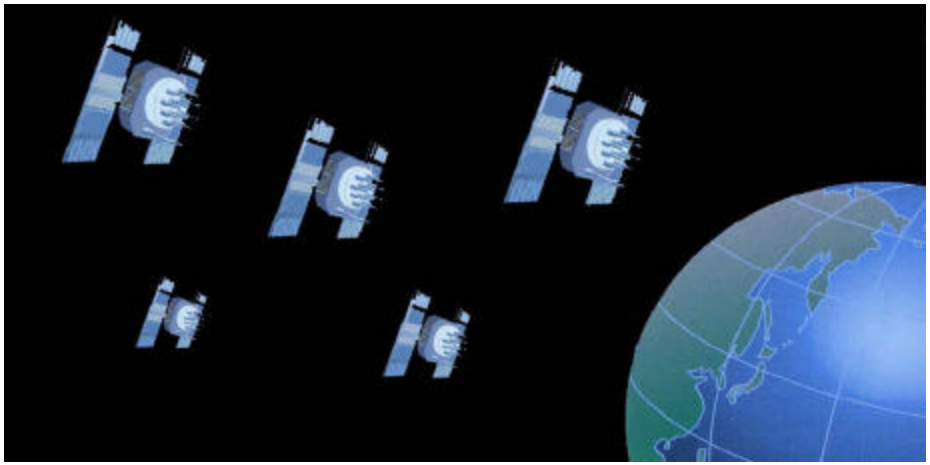
SPAWAR Systems Center San Diego

# SSC San Diego and Detachments

# Major Projects at SSC San Diego (A Short List)

- Advanced Deployable System (ADS)
- Advanced Virtual Intelligence, Surveillance, and Reconnaissance (ADVISR)
- Ashore Command Centers
- Automated Communications Management System (ACMS)
- Command Center of the Future (CCOF)
- Contingency Theater Automated Planning System (CTAPS)
- Deployable Autonomous Distributed System (DADS)
- Distributed Engineering Plant (DEP)
- Enterprise Resource Planning (ERP)
- Extending the Littoral Battlespace (ELB)
- Global Command & Control System – Maritime (GCCS-M)
- Global Positioning System (GPS)
- Information Operations Center of the Future (IOCOF)
- Integrated Installations and In-Service Engineering (ISE)
- Interactive Multisensor Analysis Training (IMAT)
- Joint Command Control Ship (JCC(X))
- Joint Tactical Information Distribution System (JTIDS)
- Marine Mammal System (MMS)
- Multi-Modal Watchstation (MMWS)
- Network Centric Computing (NCC)
- Precision Engagement Center of the Future (PECOF)
- Radio Direction Finding/Digital Selective Calling ACTD (RDF/DSC ACTD)
- Robotics
- Theater Battle Management Core Systems (TBMCS)
- Time Critical Strike
- Topside Design
- Underwater Operation/Diving

# Global Positioning System (GPS)

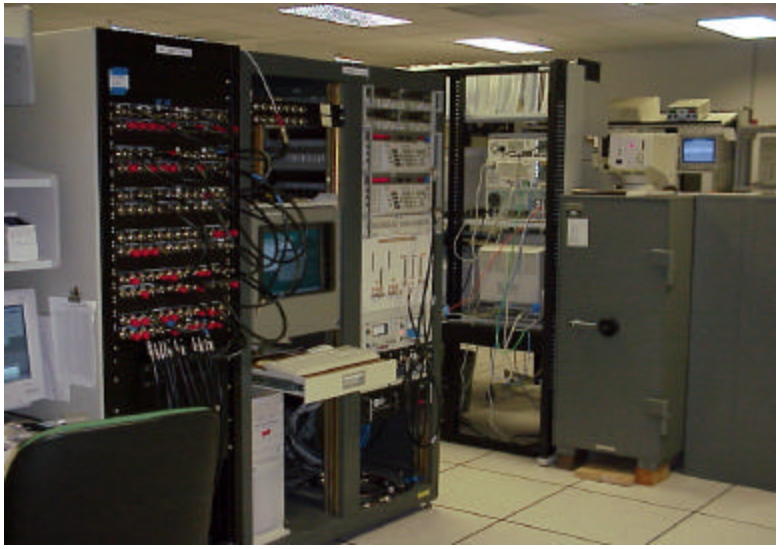


## Operation Relevance

- Major test site for GPS systems and technologies to be fielded
- Satellite simulations
- Aircraft and shipboard integration
- Navigation warfare technology

## SSC San Diego Accomplishments

- Developed open system architecture test bed
- Developed GPS interference detection and nuller system developed
- Developed wavefront simulator
- Developed control display navigation unit software

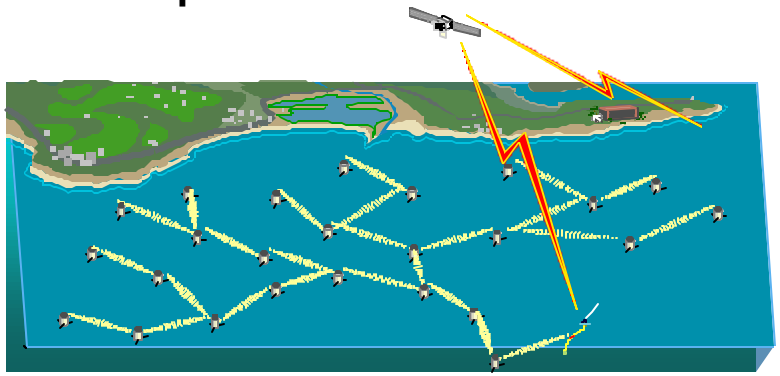


# Underwater Communications

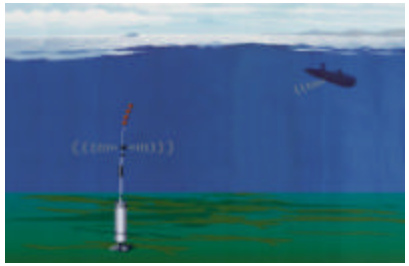
USS DOLPHIN (AGSS 555)

## Operational Relevance

- USS DOLPHIN (AGSS 555) - Navy's Deepest Diving Submarine
- Test Platform for Sonars, EHF SATCOM and ASW
- Seaweb - Extending Net-centric $C^4$ISR into the Undersea Battlespace



Seaweb



## SSC San Diego Accomplishments

- USS DOLPHIN (AGSS 555) Test Director
- Demonstrated Telesonar at Speed and Depth
- Demonstrated Email Capability at Speed and Depth

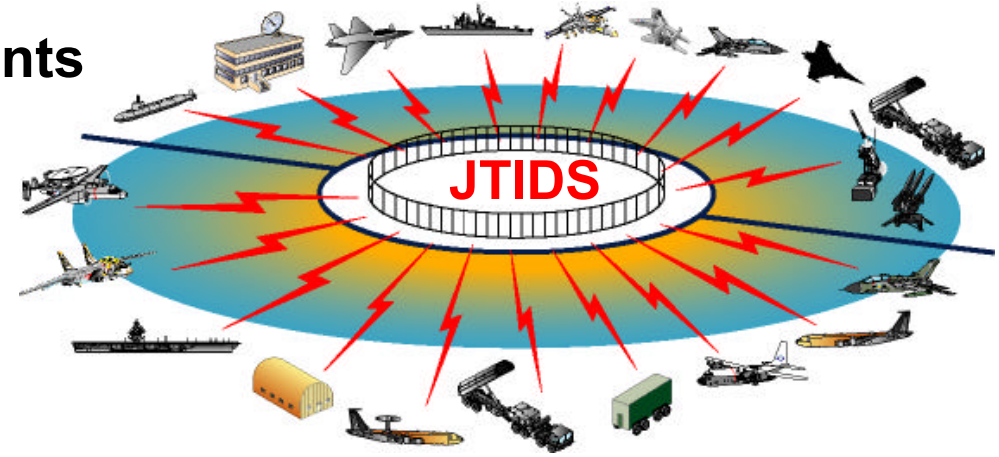
# Tactical Data Links (TADILs)

## Operational Relevance

- Provide high-capacity, secure tactical data in distributed environments

## SSC San Diego Accomplishments

- Developed Link 11/14
- Developed Command and Control Processor
- Developed Common Data Link Management System




**5000 Joint/Allied Platforms by 2015**

# Fleet Battle Experiments (FBEs)

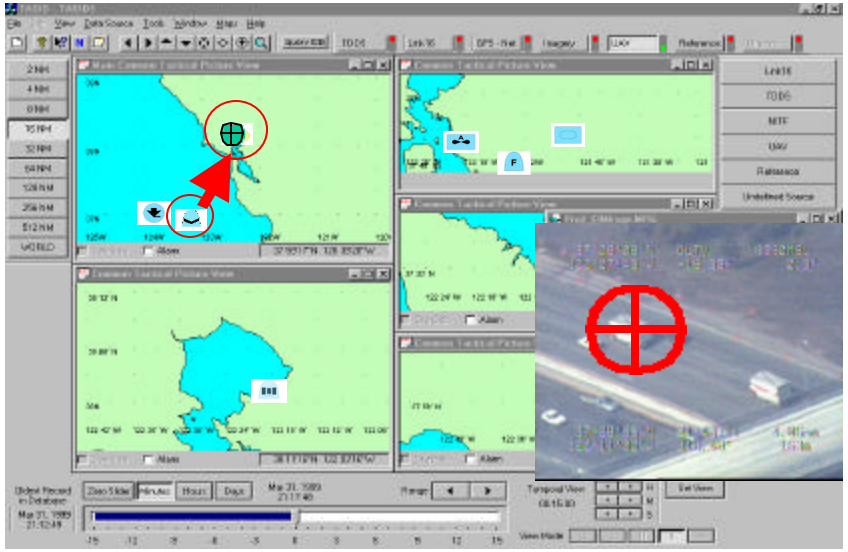

## Operational Relevance

- Navy Warfare Development Command (NWDC) established to lead Navy FBEs
- Provides valuable Fleet insight into developmental C$^4$I Systems
- First step to streamlining warfare concept development, doctrine refinement, and warfare innovation process

## SSC San Diego Accomplishments

- Primary design, engineering, and contracting agent for all FBEs
- Rapid and flexible engineering and contracting skills critical to FBE success
- Supports NWDC in developing new concepts
- Directly supports Center-wide vision

Tactical Advanced Situation Information Display



# Fleet Installations and In-Service Engineering

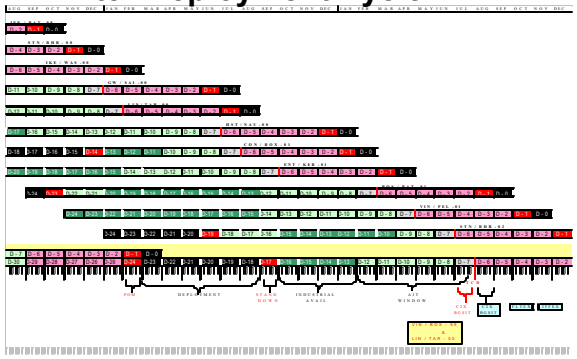
## SSC San Diego

- 2615 Ship and Submarine C$^4$ISR/IT Installations in past 2 years
- 280 Shore System Installations

## BG/ARG Responsibilities

- *Lincoln/Tarawa*
- *Constellation/Boxer*
- *Vinson/Peleliu*
- *Stennis/Bon Homme Richard*
- *Kitty Hawk* (FDNF)
- All Pacific Fleet Ships

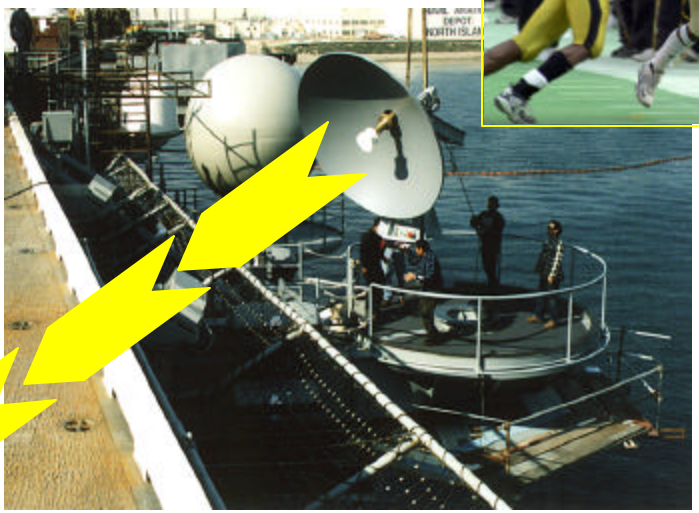
Inter-Deployment Cycle



**Integrated BG/ARG Installations**

# Contributing to Quality of Life - Television Direct to the Sailor (TV-DTS)

**. . . providing real-time TV on board ships anywhere in the world**



# Partnership with Industry
## Building Toward the Future

### MOA between SPAWAR and PEO DD21

**... to facilitate *sharing the substantial national investment in technology at SPAWAR with the industry teams* participating in the DD 21 program.**

### Teaming Relationships for DD 21 and CVN 77

- Full range of technical services at the Center
- Lockheed Martin DD 21 agreement
- Raytheon DD 21 and CVN 77 agreements
- Protection of competition-sensitive information

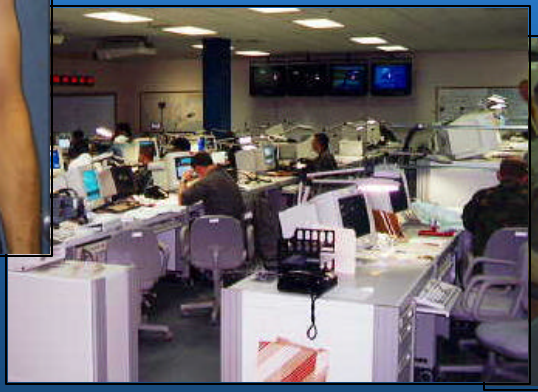
# SSC San Diego's Full-Spectrum Capabilities

Talented People

Research and Development

Operational Experimentation

Fleet Support and Engineering



Unique Facilities

System Developments

**Conceive…Develop…Support**

SSC SAN DIEGO

SPAWAR Systems Center San Diego

# C4ISR...

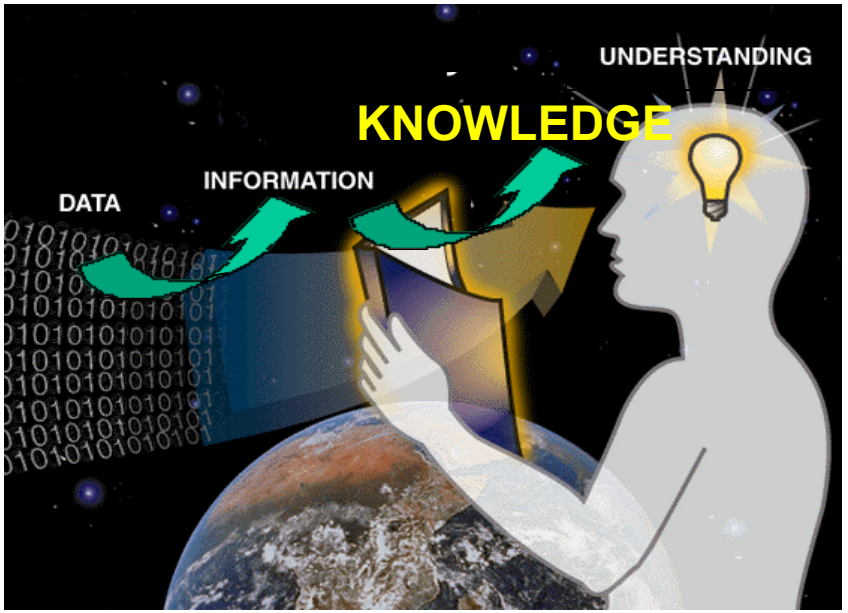
# Vision

*...for the Future*

# Centers of Gravity for Dominance of the Battlespace

## The Knowledge Revolution

- Situational Understanding
- Speed of Command
- Precise Execution
- Agility




*In an Information-Dense World, Knowledge Wins*

- $C^4ISR$ is the knowledge difference - support for people making critical decisions in uncertain, high risk situations
- The more critical and complex the situation, the more valuable the $C^4ISR$

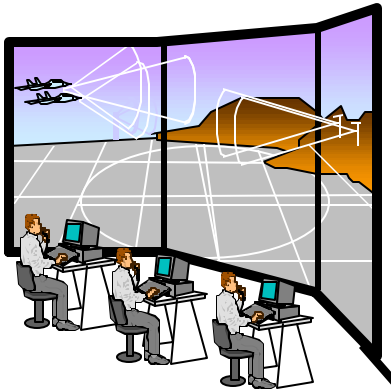
# Communications for C4ISR

SSC SAN DIEGO

SPAWAR Systems Center San Diego

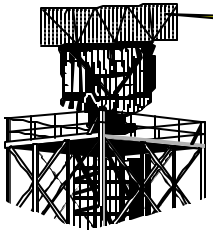
## C2 Applications

- GCCS
- Battle/crisis management
- Collaborative planning
- Multimedia databases
- 3D navigation
- Security

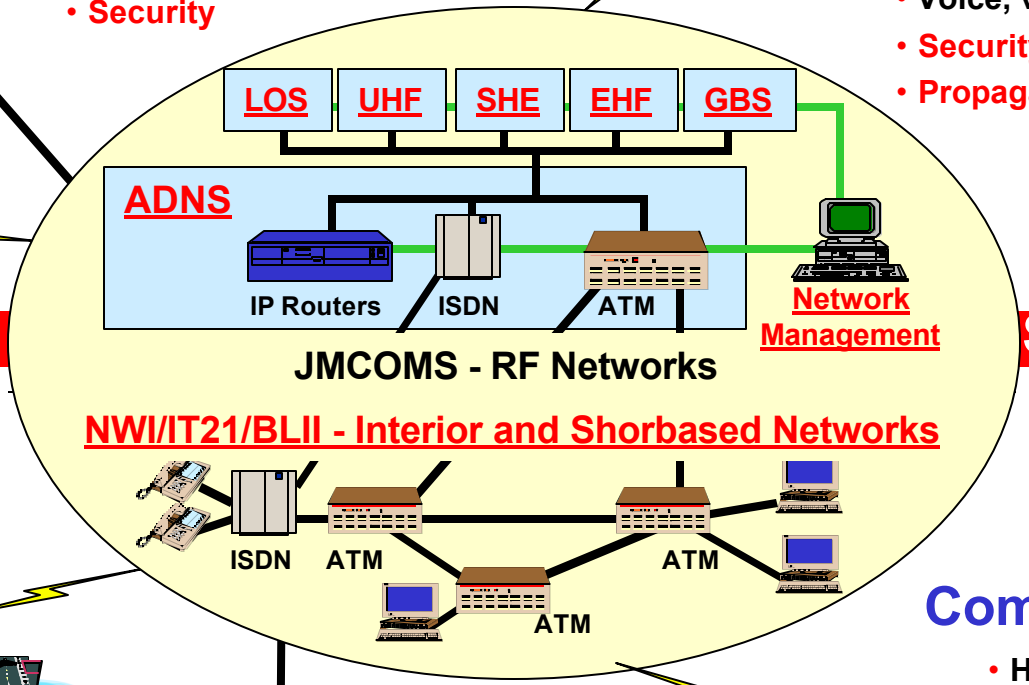


## Communication Services

- Telemedicine
- Desktop conferencing
- Voice, video, data
- Security
- Propagation



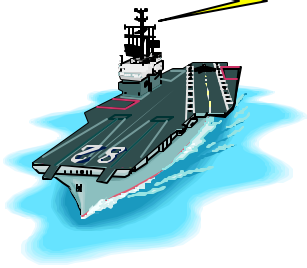
Sensor

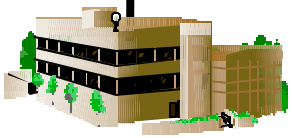



Shooter

## ISR

- SURTASS
- TIPRS
- ULITE





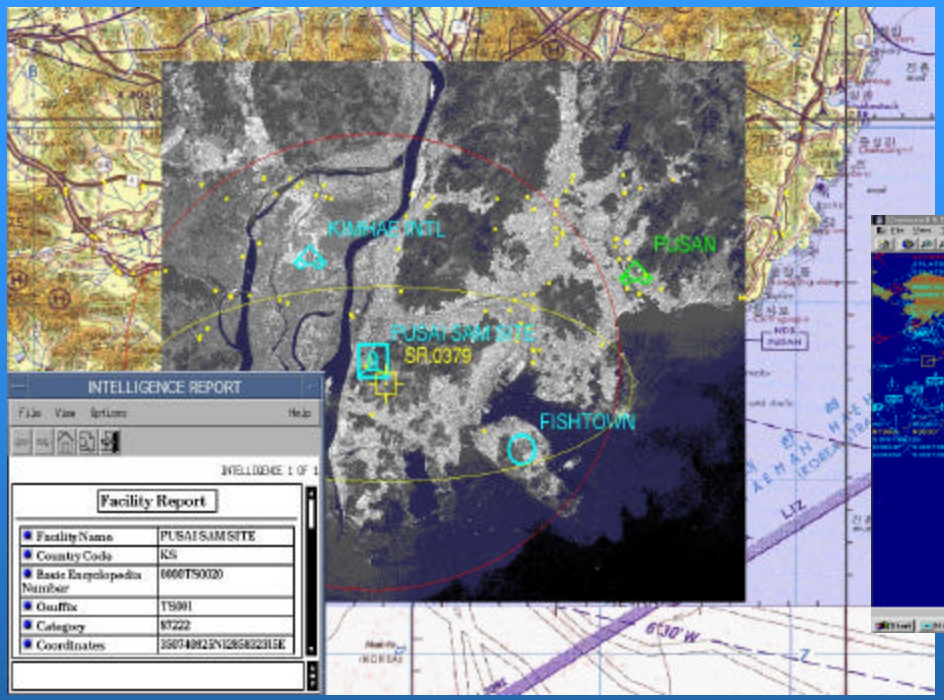
## Computers

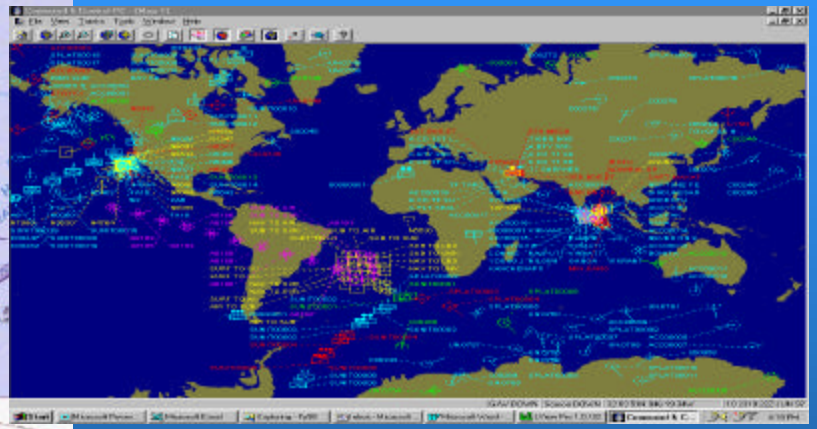
- HPC
- Distributed Computing
- TAC
- Operating Systems

# Global Command and Control System–Maritime

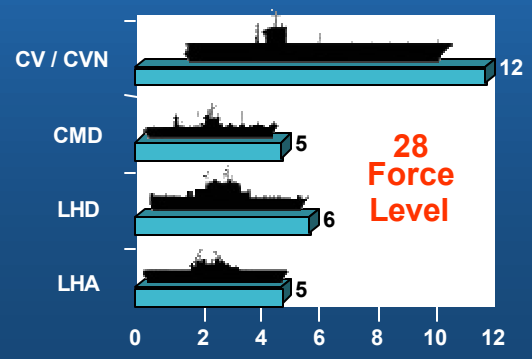
SSC SAN DIEGO

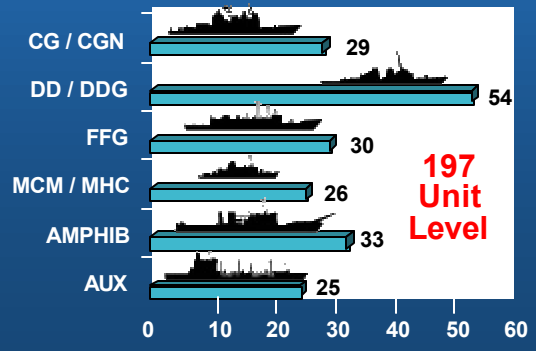
SPAWAR Systems Center San Diego



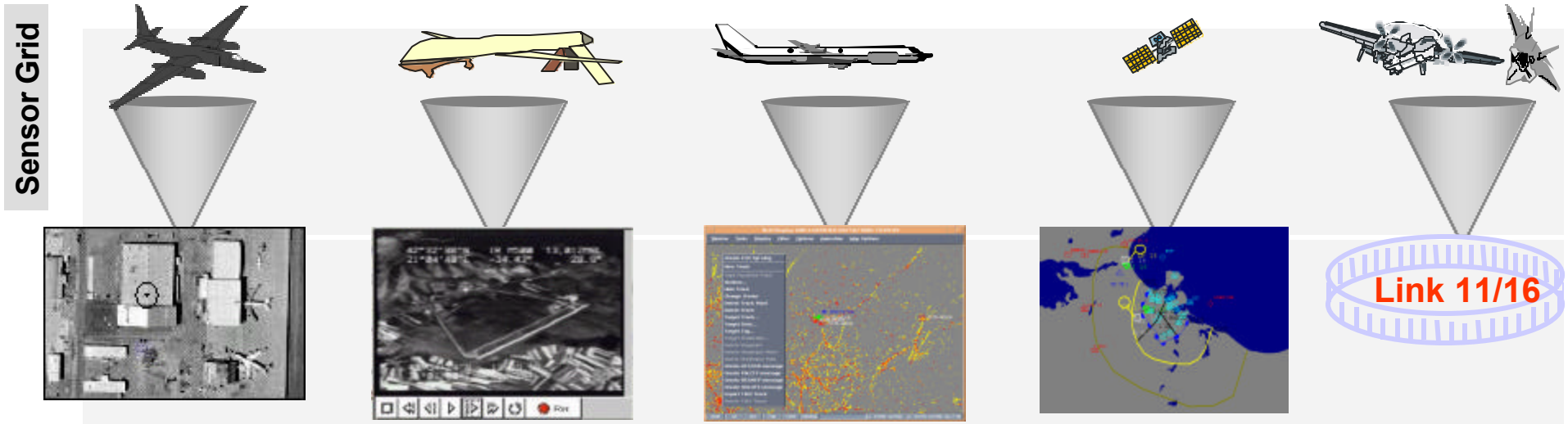
**Integrated and scalable C³I information management capabilities in support of the warfighter**



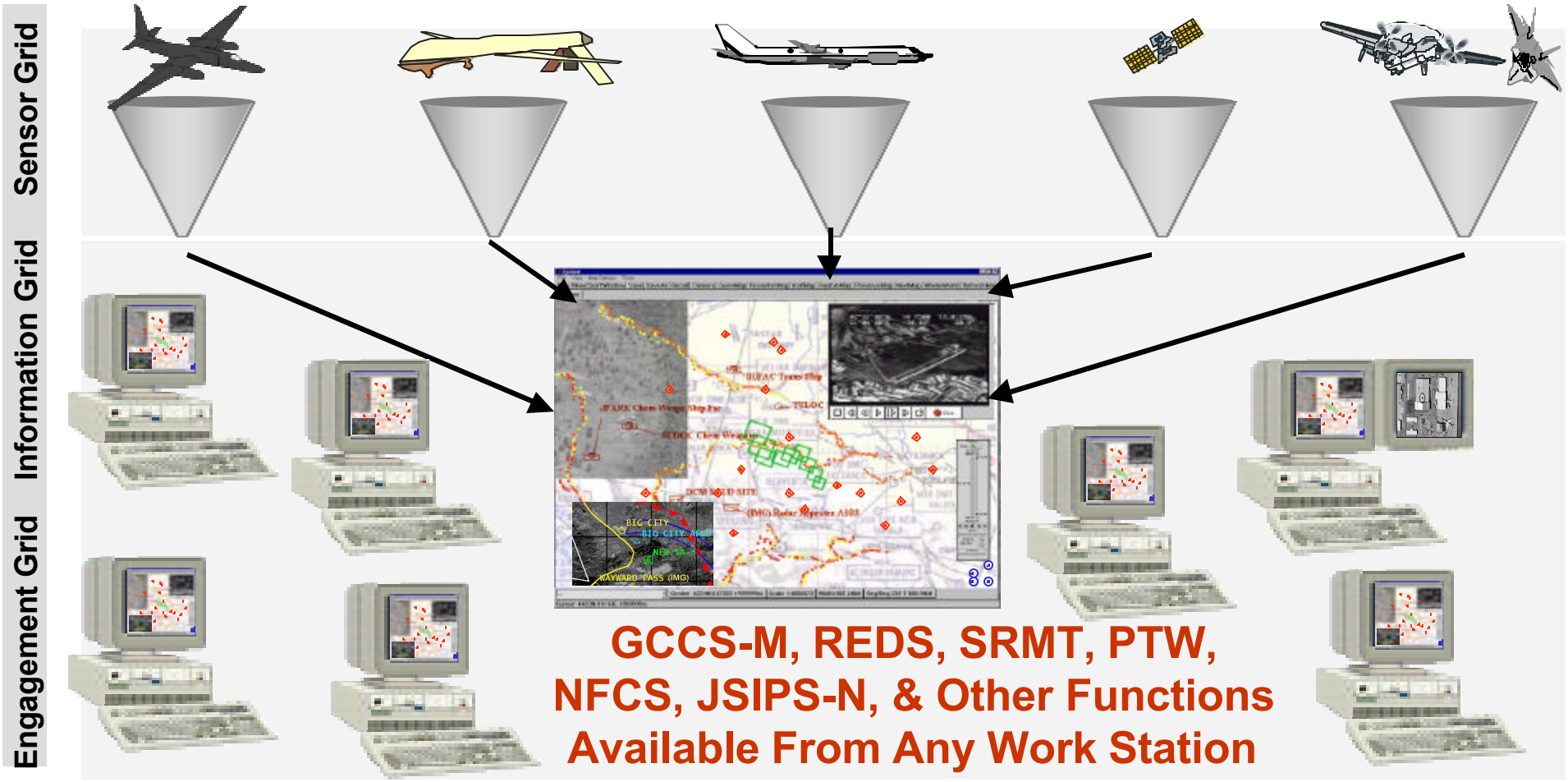

# Future Integrated Data & Display

- Sensor data overlayed on fused data assists in target ID/Class



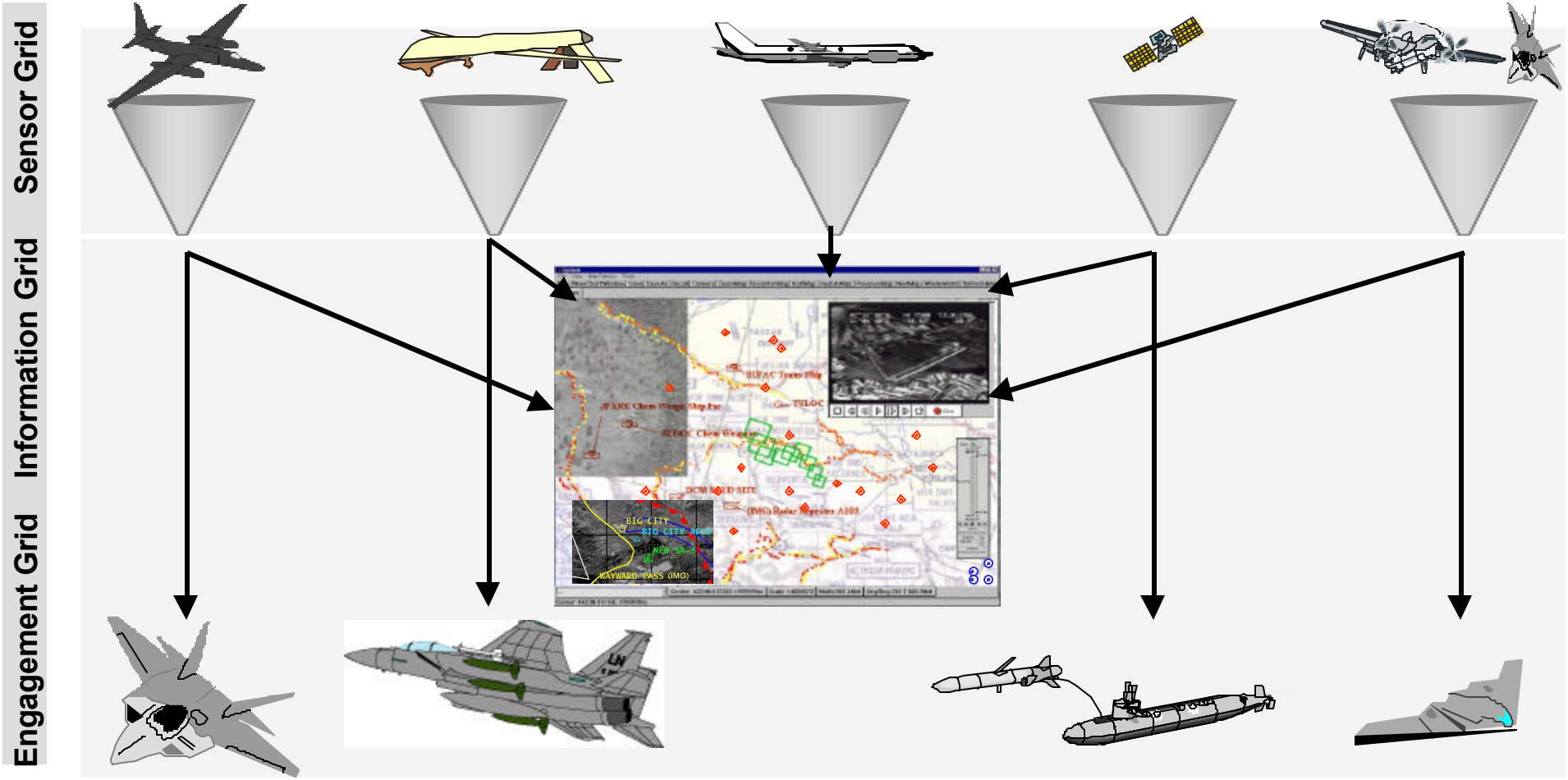
# Future Integrated Data & Display

- Sensor data overlayed on fused data assists in target ID/Class
- Can support information grid and portions of engagement grid



# Future Integrated Data & Display

- Sensor data overlayed on fused data assists in target ID/Class
- Can support information grid and portions of engagement grid
- Once target is identified, direct sensor/shooter is enabled



# Command Centers

## SSC San Diego Accomplishments

- Developing Joint Command Centers

  (JFCOM, PACOM, SPACECOM, STRATCOM)
- Design and Installation at 17 Sites
- Deployed 5 Mobile Command Centers

**USCINCPAC Command Center**

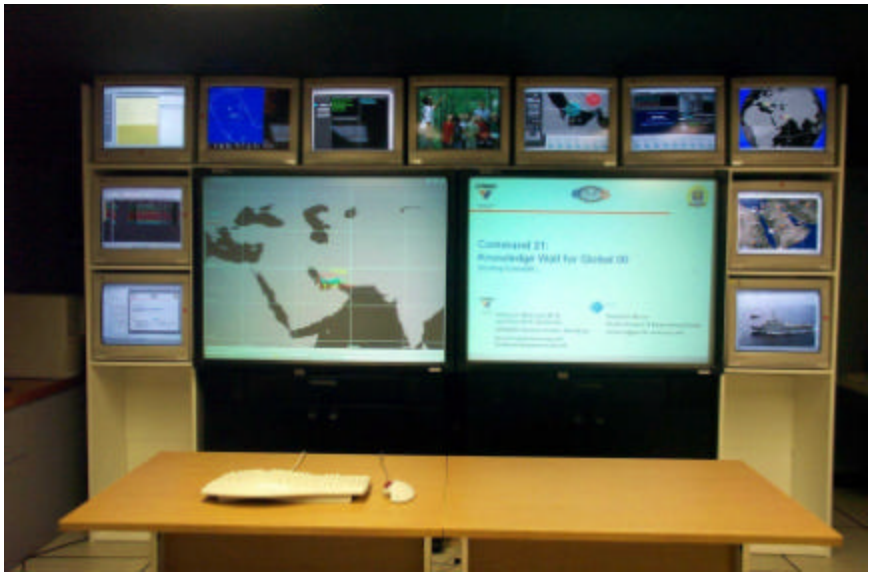
**Integrated state-of the-art 27-cube video wall into Command Center**

**Lead J6 IPT for Design of New USCINCPAC Command Center "CINC 21/HQ 21"**

**FUTURE "HQ 21"**

# Command 21:
# Decision Support for Operational Command Centers (DeSOCC)

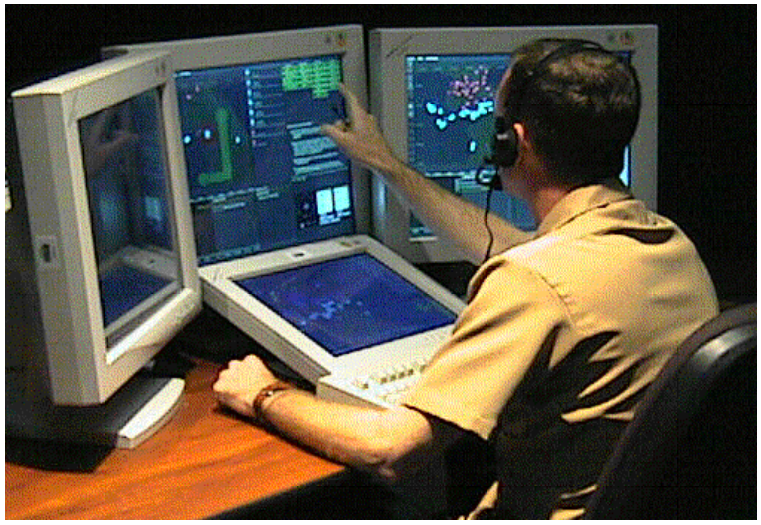
"Knowledge Wall"



## Operational Relevance

- Enhance Warfighter decision-making at all levels of Command

Multi-Modal Workstation



## SSC San Diego Accomplishments

- Research into collaborative decision-making
- Knowledge Wall installed onboard USS CORONADO (AGF 11) , USS CARL VINSON (CVN 70), and at the Naval War College

SSC SAN DIEGO

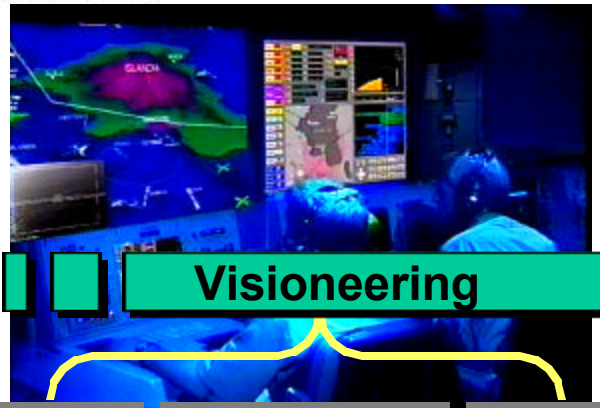
SPAWAR Systems Center San Diego

# Command Center of the Future at SSC San Diego

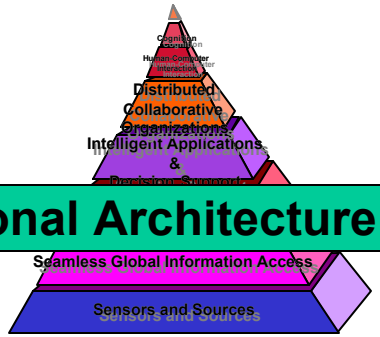
# Command Center of the Future
# The Process

SSC SAN DIEGO

SPAWAR Systems Center San Diego



Visioneering




Notional Architecture

Analysis | Production | Feedback

DoD Technology Investment

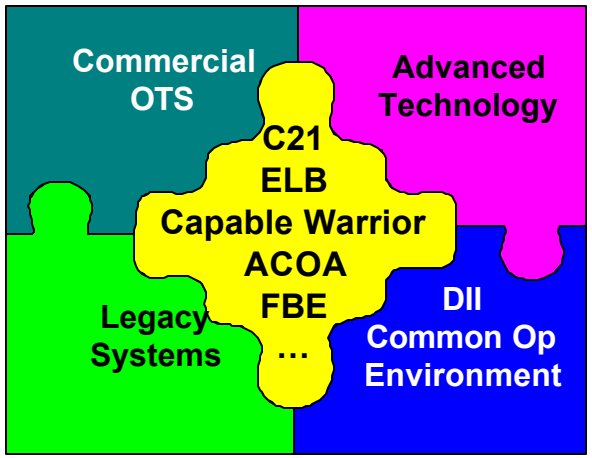
$

$

Industry Technology Investment

COTS COTS COTS

GOTS GOTS GOTS

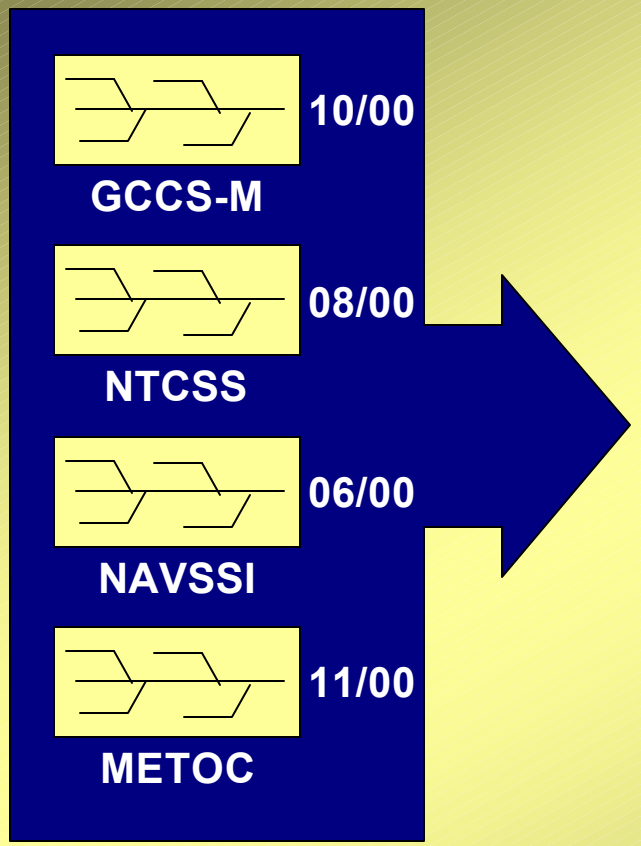



Roadmap | Systems Engineering and Integration | Transition

# Horizontal Integration

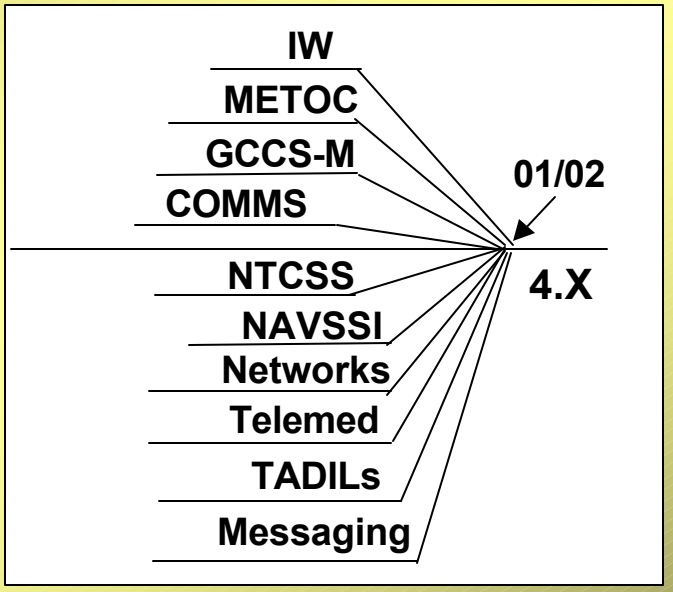
## TODAY

**Multiple Developments and Deliveries**




## HORIZONTAL INTEGRATION

**Single Development and Delivery**

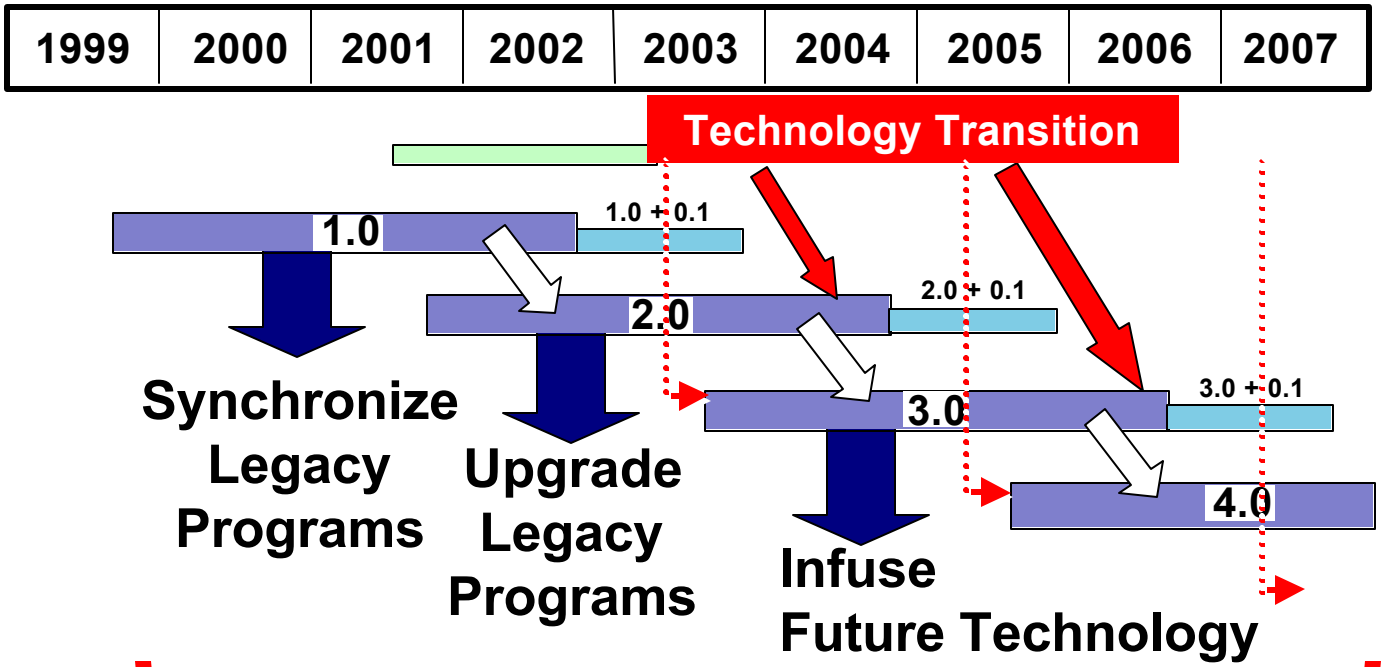



## Six Tenets of Horizontal Integration

1. Provide Major Operational Upgrades
2. Single Development Evolution
3. Single Software/ Hardware Baseline
4. Integrated BG Installation
5. Integrated Test Events
6. TOC Reduction Focus

# Horizontal Integration

**Multiple Developments With Integrated Delivery to Reduce Total Ownership Cost**




**Integrated Installation / Testing**

**Upgrading Deploying Battle Groups**